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Garden-art and Architecture.

IF the art of gardening in America is to develop in a vigorous and versatile way, it should have the intelligent support of the architectural profession. French architects recognize its importance to some extent; they feel that it is a needful adjunct to architectural art, and the problems given out in the Parisian schools require that the surroundings of the proposed building shall be developed as well as the building itself; but the full value, the wide range, and often independent character of gardening-art, are not thoroughly understood, even in France. This is proved by the phrasing of a precept which one constantly hears in Parisian studios: "The art of gardening must be studied, for it is the sauce of architecture."

The art of gardening, in the broad sense, is much more than this. It is the art of design applied to the creation of beautiful pictures on the surface of the ground. Sometimes, in truth, it must merely supplement the art of architecture; but sometimes, on the other hand, architecture must become its handmaid and helper; and, as a whole, it is a vital, independent, individual art, the sister, not the servant, of architecture. This fact should be recognized in America, for it is the home of the greatest of all the masters of this art, or the greatest, at least, of those who have followed its naturalistic branch; and where have been created, if not the finest private estates in the world, yet the finest of those great public parks which are among the landscape-gardener's most difficult tasks, and which, more than any other products of his hand, show how truly independent his art may be.

All lovers of this art must therefore regret that some architects do not appreciate its dignity, or even recognize its existence. Too often they ignore it in their practice, even when the designing of a building ought not to be their controlling artistic purpose, but rather the designing together of a building and its surroundings with such unity of purpose that the whole shall be a consistent creation.

The architectural journals, too, do not always recognize the value of garden-art, and even when they attempt to give instruction in this field their teachings may be incorrect and misleading. For example, the pages of an architectural quarterly of good repute lately contained an article entitled "A Hint for Preparing a Country-house," with an accompanying plan, which included grounds as well as house. The author speaks to those who want "inexpensive country-places, with the grounds laid out in a sensible manner, or as the occupant wishes, and the house modern and exactly what the occupant likes"; and, he asks, "In what way are such places to be obtained?" The first part of his answer is wise enough: "Each man must prepare his own country-place" if it is to suit him precisely. But the next phrase, "This is not a difficult thing to do," is misleading, if doing is understood in the sense of doing well. Then he supposes that a site of some three acres, with a frontage of about 200 feet on a high-road, has been secured, in convenient nearness to a small settlement on a line of railway; and finally he passes to specific suggestions for its treatment. The ornamental grounds are to occupy about one-third of the whole area, having, therefore, a depth of some 250 feet and lying next the high-road.

The first thing to do for their improvement, says the author, "is to remove every tree on the front lot and have their stumps extracted. Then the lot should be plowed, graded and rolled and seeded. In the fall or spring the trees are to be planted. . . . The line for the front of the house should be placed back from the new front fence-line, say seventy-five feet. Referring to the illustration, it will be seen that along the front fence, ten shade-trees have been located. Down each side fence are eight Cherry-trees, these combining fruit and shade. Surrounding the location for the house are eight Maple-trees, and on one side of each of the two front carriage-roads are two shade-trees. Along the back roads are placed Pear-trees, eighteen in all, and intervening, in three rows of three trees each, are nine Apple-trees. Additional Apple and other fruit-trees may be placed in the rear lot to any desired number."

This certainly is far from an ideal scheme for a small place, but the full measure of its folly cannot be explained without reproducing the plan. Suffice it to say that, in a place of only 200 feet frontage there are two carriage-drives of equal importance leading to the house, and two similar ones leading away from it, one of the latter to a stable, but the other to—what? It is hard to divine the nature of the little building indicated at its termination unless we assume it to be the coachman's cottage; and it is hard to assume a coachman who requires a carriage-approach to his door. Furthermore, these roads, converging at the house, encircle it on all four sides with broad stretches of gravel, thus giving it an isolated station, as of a boat on a beach, when it ought to have at least three of its fronts based on the grass and united to the soil by green and sheltering plantations.

We do not think that in all cases the scheme for small grounds ought to be a true landscape-scheme, or even a definitely informal scheme. Regularity—even geometrical regularity—can be made very beautiful on certain sites, amid certain surroundings, and with a house of a certain character. But when a man is so enamored of regularity that he advises, as the necessary first step, that all the trees which may exist on a place shall be destroyed, and that its surface shall be "graded" (by which he evidently means made quite flat), then he ought surely to devise some artistic scheme of formality. But in this case the roads are neither simply straight nor pleasingly curved. They converge at the house in awkward sweeps, so as to emphasize the mistake of their needless repetition. Again, plantations of trees must make something—if not naturalistic groups and pictures, then shady lanes and bowers. But in this case the Maples and fruit-trees simply run along the fences and along one side of the roads, producing a stiff, yet not a rightly formal, systematic effect. In short, an

acre of ground arranged around a house, as here suggested, would produce a mechanical, tiresome and ugly general result. There would be no union between house and grounds; no good setting for the house; no pleasing outlook from any of its windows; no attractive picture for the eye that looked inward from the road, or for the one which looked outward from the house. The most frankly inartistic method of letting things alone could hardly produce so bad a result as this attempt at new creation of a professedly artistic sort.

It is needless, probably, to say again to the readers of this journal that no good general scheme for the treatment of undetermined, imaginary country-places can be formulated. A definite scheme is of value only if the character of the lot to be treated is definitely set forth, and the reader is shown how the artist has adapted his ideas and methods to its manipulation. The present scheme would be bad enough even if the author had said, "Let us suppose an absolutely flat lot, devoid of trees and shrubs." But to assume that it is well to put an imaginary lot in this condition makes the evil teaching still more vicious.

Now that the Columbian Fair Grounds are eloquently teaching what high success can be won by sympathetic and intelligent co-operation between architects and artists in landscape, it is to be hoped that architecture will more readily accord to its sister-art its proper rank. And when architectural journals attempt to give counsel in the matter of designing grounds in connection with buildings the time has come when we are justified in expecting advice based upon sound principles.

In some recent numbers of the *Ridgefield* (Connecticut) *Press* we are pleased to see that the residents of the picturesque region of West Mountain have not only restored the sonorous primeval names of the lakes and peaks, but they have done almost an equal service in naming the roads which intersect that region. West Mountain Road, Lakeview Road, Oreneca Road, Tackora Road and Mamanassee Road are names which mean something, and which connect these highways with the history of the region through which they pass. The practical use of these names in assisting to direct travelers and to locate places is incidentally illustrated in the difficulty which the *Ridgefield Press* finds in designating clearly the particular road-ways to which these new names apply, through the want of any heretofore known names. This section of the country will be more attractive not only to those who live there, but to the public who visit it, for the change from the homely descriptive names given to its charming sheets of water by the original settlers, who naturally failed to see as much poetry in the Indian names as their descendants do. Long Pond, North Pond, South Pond, Round Pond and Burt's Pond, more recently called lakes, are now known as Waccabuc, Rippowam, Oscaleta, Oreneca and Mamanassee, from names preserved in the early records of land purchase. That these aboriginal names are thus attached to the beautiful country of whose early history they are a part, must give satisfaction to all who are familiar with this region.

A Cold Winter in North Carolina.

NOW that January is gone, and the snow and frost too, it is interesting to note some facts in regard to the coldest month on record in the south. The cold winter of 1856-57 has long been the traditionary coldest winter in the history of North Carolina. The monthly mean of the cold January of 1857 was, at Chapel Hill, thirty-eight degrees. January, 1893, will break this record, going probably eight degrees lower, but I have not seen the report of the observer yet. Monthly means of temperature are, however, very misleading, and the best gauge is the effect upon vegetation. It is the lowest temperature and not the mean temperature that decides what will winter safely. Our cold January will be of great benefit to any one engaged in the study of the capacity of plants for enduring cold and the best means for protecting half-hardy plants. It is, therefore, with a great deal of interest that since the sunshine has strengthened and the frost is out of the ground I have been examining the effects of the frost and of the protection given some plants, as compared with the condition of plants not protected. The full extent of the damage done can only be determined by the way in which the plants resist the fluctuating weather of spring, for I have noticed that frequently a plant which seems to be only partially killed will continue to fail after hard frosts are gone and be dead when warm weather reappears. The present notes cannot, therefore, be regarded as the final results.

Figs vary a great deal as to hardiness in different varieties, and in the same variety under different conditions. Brown Turkey and Osborn's Prolific show little injury, but all the large white Figs are killed to the ground. Early Violette, Negro Large and other black sorts are little hurt. Celestial, the little Chinese Fig, is very little injured. A bed of yearling seedling Figs, from dried Smyrna Figs, in a sheltered place seems to be perfectly sound, except the immature tips. But before noting damage further, let me state the temperatures these plants endured. The lowest temperature observed at daybreak by an exposed standard thermometer was four degrees above zero. On other days the mercury marked eight, ten and twelve degrees, and several times sixteen to eighteen degrees at daybreak. But it must be taken into consideration that on few days did the weather continue below the freezing point all day. These figures will be seen to be extremely low when it is considered that in our ordinary winters the mercury seldom goes below twenty degrees. The early summer crop of Figs is, of course, lost, and there is damage enough to make the late crop very short. Trees protected by Pine-boughs around them are but little hurt, and if our trees had been bent to the ground and covered with Pine-boughs they would be hardly hurt at all. With a cover of earth on the branches I have carried Figs safely through much colder weather.

Prunus Caroliniana, our Laurel Cherry, or Mock Orange as it is called here, has its foliage utterly destroyed, and Live Oaks likewise. Pittosporum Tobira, fully exposed to sun and wind, has its foliage badly browned, but not crisped like that of the native Prunus Caroliniana. This plant will winter in New York City, I believe, if protected from the morning sun and wind. One would suppose that Magnolia fœtida would have suffered, but I have so far not seen a scorched leaf. Chinese Tea-plants, of which I have 3,000 in an exposed place, have their foliage browned as badly as Pittosporum. Gardenia florida, sheltered close under the walls of the college, will lose its foliage and young growth, but the stem and main branches are sound. Satsuma, or Oonshin Oranges, fully exposed to sun and wind, are dead down to the Trifoliata stock. Two other trees, one of which is covered with Pine-boughs and the other close to a board fence which caused the snow to bank over a great part of it, are both in about the same condition, the leaves and young shoots dead, the stem and large branches still perfectly sound. With protection, in a sheltered place, there is no doubt that this Orange will succeed here, and as it makes only a bush on the Trifoliata stock the protection is easily given. Our trees of Citrus trifoliata do not show an inch of injury, in fact, none at all, although the experimental hedge is fully exposed to the northern blast for twenty miles. This is, doubtless, the coming hedge-plant for the United States. It will make a good hedge with but a tithe of the labor required by the rank Maclura.

Neriums (Oleanders), unprotected in the yards in town, are certainly killed to the ground and, probably, entirely dead. Those which I bundled up with Pine-boughs are also killed two-thirds or more. Abutilon vexillarium, pulled down off the trellis on my piazza and drawn in through a hole in the brick wall under the piazza, with its base covered with strawy manure and Pine-boughs, seems unhurt. Aucubas will lose most of their leaves when fully exposed. Chinese Azaleas, in a sunny place, were so seriously hurt by the hot weather last summer that they are now badly killed back. The heat hurt them worse than the cold. Roses are injured worse than I have ever seen them. Banksias, on porticoes, and Maréchal Niels will lose not only their foliage, but all immature wood. All our Tea Roses have their foliage killed and all the late shoots, but no plants are lost so far as I have observed, though in low-lying places some may be killed down. Cuttings of Hybrid Perpetuals, which we usually root easily in the open ground, and of which I have some thousands in, have suffered badly and I fear will be a total failure.

Raspberry-canes of many varieties, even Black Caps, are badly killed. Fruit-tree buds are as sound as can be, and the winter has been favorable to a good crop of peaches. The leaves of the more tender sorts of Narcissus which have shot up are scorched, but are not hurt. How our Amaryllis, Cannas

and Caladium esculentum in the ground are doing I have not examined. Many are doubtless killed, for the soil has been deeply frozen. The severe weather will add much more to our knowledge of the capacity of plants to resist cold, but our losses will doubtless be heavy. In the mountains the weather was Canadian.

Raleigh, N. C. *W. F. Massey.*

Notes on the Forest Flora of Japan.—V.

AMONG the Magnolias of Japan there is no evergreen species which resembles the great evergreen Magnolia of our southern states or at all equals it in the beauty of flowers and foliage; and the nearest approach to an evergreen Magnolia in the empire of the Mikado is the representative of a closely allied genus, Michelia, which differs from Magnolia in the position of the flowers, which instead of being terminal on the branches are, except in the case of one Indian species, axillary; and in the number of ovules and seeds, which are two in each carpel of Magnolia and more than two in each carpel of Michelia.

Michelias, of which a dozen species are known, inhabit southern and south-western Asia, including the islands of the Indian Archipelago, and, with the exception of the Chinese Michelia fuscata (or as it is habitually called in the southern states, Magnolia), which is cultivated for its exceedingly fragrant small flowers in all warm temperate countries, the genus is not seen in American or European gardens.

The Japanese species, Michelia compressa,* as it appears in the Botanic Garden of the University of Tokyo, is a tree thirty to forty feet in height, with a trunk twelve to eighteen inches in diameter, covered with smooth dark bark, and rather slender branches which form a compact handsome round-topped head. The winter-buds and the branchlets during their first year are clothed with soft ferrugineous or pale hairs; in their second season the branchlets are slender, light or dark brown, marked especially near their extremities with large pale lenticles, and conspicuous from the raised nearly circular leaf-scars. The leaves are oblong or narrowly obovate, gradually contracted into long slender petioles, and are rounded or short-pointed at the apex, entire, coriaceous, conspicuously reticulate-veined, dark green and lustrous on the upper and pale and opaque on the lower surface; they are three or four inches long, an inch to an inch and a half broad, with petioles an inch in length, and fall when a year old after the appearance of the new shoots. The flowers, which are very fragrant, are from an inch to an inch and a quarter across when expanded, with pale yellow, narrow, obovate sepals and petals, nearly sessile anthers, and a stipitate head of pistils, the ovaries, according to Maximowicz, each containing five or six ovules. The cone of fruit is two inches long and is raised on a stalk half an inch or more in length; the rusty brown thick-walled carpels, which are marked with large pale circular dots, usually containing three seeds; these are broadly ovate and much flattened by mutual pressure.

Michelia compressa is the most boreal species of its genus; it was discovered near Nagasaki by Maximowicz, who saw a single tree. Oldham, an English botanist, collected it near the base of Fugi-san, doubtless from a cultivated tree, and it is said to be found in several places in the extreme southern part of the empire, although I have never seen it except in the Botanic Garden of Tokyo, where there are several large trees from which were collected the specimens figured in our illustration on page 77, from a drawing made by Mr. Faxon. It is not improbable that Michelia is at the northern limit of its range in Japan and that it will be found to be more at home on the Loochoo Islands or on Formosa when the interesting flora of these islands is carefully explored.

The fact that Michelia compressa flourishes in Tokyo, where our southern evergreen Magnolia hardly survives, indicates that it may perhaps be grown as far north as Washington and, possibly, Philadelphia, in southern England and Ireland and on the west coast of France, that is, in regions where no other species of Michelia can exist in the open ground and where broad-leaved evergreen trees are rare and much desired.

In Japan, representatives of two other arborescent genera of Magnolia, Trocodendron and Illicium occur. The former is endemic, monotypic, and, like Cercidiphyllum and Euptelia, produces flowers without sepals and petals. Trocodendron aralioides is a small, handsome, glabrous evergreen tree with alternate broadly rhomboidal crenulate, penni-veined leaves four or five inches long, borne on long stout petioles and clustered at the extremities of the branches. The flowers are produced in short terminal racemes and consist of numerous anthers raised on slender filaments and surrounding the carpels, which are connate in a vertical series and which ripen into a small fleshy fruit crowned by the remnants of the persistent styles. It is a tree fifteen to twenty feet in height and is said to be very common in some parts of the country, although I never saw it growing wild, and it is certainly not an inhabitant of alpine forests or of Hokkaido, as is stated in some works on the Japanese flora, although, perhaps, it occurs north in Hondo, at the sea-level, as it is hardy in the gardens of Nikko, at an elevation of 2,000 feet above the ocean. Trocodendron aralioides is not infrequently cultivated by the Japanese, and fine specimens of it are found scattered through public and private gardens in Tokyo and Yokohama.

The Japanese Illicium is a more beautiful and interesting plant. It is the representative of a genus with two species in our southern states and half a dozen others in India and southern China, one of which, Illicium verum, supplies the star anise of the pharmacists. Illicium anisatum, or as it should, perhaps, be called, Illicium religiosum, is a beautiful small evergreen tree, fifteen or twenty feet high, with brilliant persistent leaves and small fragrant yellow flowers, and one of the sacred plants of Japan. Siebold considered it a native of China or Corea and an introduction by Buddhist priests into Japan. This may be the correct view, although Japanese botanists now believe it to be a native of the southern part of the empire, where Rein found it, as he supposed, growing wild. Sacred to Buddha, it is always planted in the neighborhood of his temples and is common in private gardens as far north as the thirty-fifth degree of latitude. The branches of this tree, especially when it is in flower, are used to decorate the altars in the temples, or in cemeteries serve to mark the respect of the living for the dead. From the powdered bark, mixed with resin, are prepared the "smoke candles" with which incense is made in the temples, and with which the "moxa" is burned on the human body as a sovereign cure for many of its ills.

The remaining Japanese plants of the Magnolia family, Katsura and Schizandra, are woody climbers. Katsura Japonica is the type of a genus consisting of seven or eight species, all natives of southern and western Asia, and its most northern member growing spontaneously in the southern islands and at the sea-level in Hondo as far north as the thirty-fifth degree of latitude. The flowers are not showy, but it is a plant of extraordinary beauty in the autumn when the clusters of scarlet fruit are ripe, their brilliancy being heightened by contrast with the dark green lustrous persistent leaves. There is a fine specimen of this plant in the garden attached to the Agricultural College at Tokyo, but I have never seen it in any other, although it might well be grown wherever the climate is sufficiently mild, as in the autumn no plant is more beautiful.

Schizandra is familiar to American botanists as one species; the type of the genus, Schizandra coccinea, inhabits our southern states; in Japan two species occur, and one of these, Schizandra Chinensis, which grows also in Manchuria, carries the Magnolia family further north than any of its other members. It is a vigorous plant, with long twining stems and small, unisexual, white flowers,

* Magnolia (Michelia) compressa, Maximowicz, *Mél. Biol.*, viii., 506. Franchet & Savatier, *Enum. Pl. Jap.*, i., 15.

followed by clusters of brilliant red berry-like fruit, which in September and October enliven the forests of Hokkaido, where this plant is extremely common. Schizandra Chinensis is now well established in our gardens, flowering freely every year, but in the neighborhood of Boston has not yet ripened its fruit.

The second species, Schizandra nigra, is much less common in Japan than Schizandra Chinensis, from which it may be distinguished by its broader leaves, larger flowers, and by its blue-black fruit and pitted seeds. It grows in southern Yezo, where, however, I failed to find it. Mr. Veitch collected it in September at Fukura, on the west coast of Hondo, and at the end of October I found a single plant near Fukushina, on the Nagasendo, in central Japan, from which I had the good fortune to gather a few ripe seeds, as this interesting plant has not yet been brought under cultivation. *C. S. S.*

Entomological.

A Destructive Elm-tree Bark-borer.

WE are permitted to extract from Dr. J. A. Lintner's "Report on Entomology," presented at the annual meeting of the Western New York Horticultural Society, at Rochester, on the 26th January, the portion relating to a very pernicious Elm-tree pest, the operations of which have not received much attention from our economic entomologists. After speaking of Zeuzera pyrina, Labr., a destructive borer of some of our most highly prized shade-trees, as the Elm and Maple, which, during the last five years, has been brought to notice in northern New Jersey, and in New York city and its immediate vicinity, Dr. Lintner stated that

These attacks are yet quite local in this state, but are destined, we fear, not long to continue so. Throughout the entire state, and beyond its limits, the beautiful White Elm, Ulmus Americana, which has been so liberally planted and so highly prized as our most valuable shade-tree, is suffering from the ravages of a hidden and insidious enemy, and the trees are dying, one by one, from a cause not apparent and known to but few. This is chargeable to the operations of one of our longicorn beetles, Saperda tridentata, Olivier, the larvæ or grubs of which work in the inner bark and sap-wood of the trunk—the attack apparently commencing not far above the ground and gradually extending upward. When the grubs are numerous, their broad, flat burrows so reticulate and run into one another as effectually to girdle trunks of two and three feet in diameter; with the circulation arrested, the death of the tree inevitably follows.

No effective remedy against this attack has as yet been found. It is probable, however, that where it has not proceeded too far, protection may be attained in coating the bark with some thick repellant substance (of which carbolic acid and Paris green should be components) that would repel egg-deposit or prevent the passage through it of the newly hatched larva. This coating need not be applied to the entire trunk, but might be limited to a broad zone of several feet at and beyond that part where the burrows of the preceding year were mainly run—to be found by removing portions of the bark, which will readily scale off from the deserted older infested portions.

A still better remedy, I think, would be to remove the outer bark from the entire infested portion of the tree in the spring (occupied at the time by larvæ or the pupæ), by shaving it down to the inner bark until the first indications of the fresh burrows are disclosed. A kerosene emulsion of good strength brushed over the shaven surface would kill the insects, after which a coating of some thick substance, as lime and cow-manure, should be applied to prevent the splitting of the sap-wood from exposure to the sun, drying winds or extreme weather.

That the barking of Elms to even a greater extent than this may safely be resorted to, appears from experiments made in France by Monsieur Robert, detailed in the *Gardeners' Chronicle and Agricultural Gazette*, for April 29, 1848, and quoted by Dr. Packard in his recent report on *Insects Injurious to Forest and Shade Trees*, as follows: "The whole of the outer bark was removed from the Elm; this may be done conveniently by a scraping-knife shaped like a spokeshave. The operation caused a great flow of sap in the inner lining of the bark (the liber), and the grubs of the Scolytus beetle were found in almost all cases to perish shortly after. The treatment was applied on a large scale, and the barked trees were found after examination by the commissioners at two different periods to be in more vigorous health than the neighboring ones of which the bark was untouched. More than two thousand Elms were thus treated."

Monsieur Robert had also obtained good results from cutting out strips of the bark of old Elms, about two inches wide, from the boughs down to the ground. "It was found that where the young bark pressed forward to heal the wound and a vigorous flow of sap took place, that many of the larvæ near it were killed; the bark that had not been undermined was consolidated and the health of the trees improved." For a long period of years the Elm had been remarkably free from insect-attack, but now it is struggling for existence against four insect-destroyers, so pernicious in their operations that we are almost compelled to look upon it as a doomed tree. The Leuzera is robbing it of its beautifully branching top; the Elm-leaf beetle is defoliating it and rendering it in midsummer useless for shade; the caterpillars of the white-marked Tussock-moth (Orgyia leucostigma) are skeletonizing its leaves and arresting terminal growth by amputating the ends of the twigs and strewing them over the ground; and, lastly, the three-toothed Saperda—the most dangerous of all—is running its mines through sap-wood and liber so closely and tortuously that the death of the tree is the inevitable result.

It is sincerely to be hoped that, should these suggestions for staying the ravages of the last-named insect not prove to be practicable, other means may be found so efficient and so simple as to lead to their general use by individuals and city authorities, and that the steady progress northward and westward of the two other Elm destroyers—the Zeuzera borer and the Elm-leaf beetle—may be stayed, and the most beautiful and serviceable of our shade-trees be spared to us and to coming generations.

Foreign Correspondence.

London Letter.

Agave angustissima.—The picture and full account of this Agave, published in Garden and Forest (vol. vi., p. 5), were highly interesting to growers of succulent plants in this country, and still more interesting is the fact that, through the kindness of Professor Sargent, who sent seeds of it to Kew, it is likely soon to become known in collections here, the seeds having germinated quickly and freely. The offer of seeds through your pages (vol. vi., p. 6) to any person wishing to grow this plant should be taken advantage of by all cultivators of such species of Agave as A. filifera and A. Schottii, to which ornamental and compact growers A. angustissima is closely related. The attention of collectors and botanists generally should be drawn to the forethought and good nature which attended the rediscovery of this plant. It is difficult to interest botanical collectors in the introduction of desirable plants into cultivation.

Begonia, Gloire de Sceaux.—This is a hybrid between B. Socotrana and B. metallica (sometimes called B. subpeltata), which was raised by Messrs. Thibaut & Keteleer, of Sceaux, near Paris, in 1885, and distributed the following year as "a very floriferous, vigorous, compact, pyramidal plant, two feet high, with broad obliquely cordate leaves, deep green, with a rich metallic lustre, and terminal and axillary panicles of bright rose-colored flowers, produced in the late winter or early spring." Somehow the plant did not take in England, and it was almost forgotten when Mr. Jennings, the gardener to Mr. Rothschild at Leighton Buzzard, showed a group of it beautifully grown and full of flowers at the last meeting of the Royal Horticultural Society (January 17th). It was then generally thought to be a new plant, even those who had tried the plant when it was first sent out failing to recognize it again in the fine specimens shown. Of course, it was awarded a first-class certificate as well as a Banksian medal for good cultivation, and was generally voted the best "new" plant of this winter. The flowers stand well above the leaves, are of good size and substance, and, what is even more valuable in a Begonia, they stand several weeks both on the plant and when cut. The progeny of B. Socotrana is proving of exceptional value in the garden. Here is another instance of the good

Fig. 13.—Michelia compressa.—See page 75.

that comes from botanical collectors' bagging a few scraps of likely plants for the gardener. Professor Balfour, when on a botanical visit to Socotra in 1880, sent to Kew a few small tubers of this Begonia for the gardens, along with dried specimens for the herbarium. The result was a pretty and very interesting Begonia added to the few good winter-flowering species we possess for the stove, and, still more important, the production by the breeder of a race of

hybrids between this species and others which is likely to take a high position among the most useful of flowering garden-plants. I hope Mr. Jennings will tell how he grew his plants. I confess to having tried to grow B. Gloire de Sceaux, and failed, owing, as I believe, to winter fog.

Cyrtanthus carneus.—This is a good winter-flowering Cape bulb; at any rate, it is in flower now at Kew, and from its behavior one might expect it to turn out a good garden-plant. It is very similar to C. obliquus, but differs in the color of its flowers, which are bright red. The leaves are broad, strap-shaped, a foot or more long, and the scape is erect, two feet long, with a large umbel of drooping, fleshy, tubular flowers two inches long. Although almost unknown in cultivation now, it was introduced and flowered at Chiswick sixty years ago.

Nelumbiums.—Many of your readers evince a more than ordinary interest in aquatic plants, and especially in Nymphæas and Nelumbiums. The naturalization of the Nelumbium speciosum in your ponds and lagoons is a gardening achievement to be proud of. Could not some of your importers of Japanese plants obtain some of the distinct and beautiful varieties of Nelumbium which are known to grow in Japan? A few years ago I saw in a rare Japanese work of great value, called *Honzo Zoufu*, a series of beautifully executed colored pictures of Nelumbiums which revealed a surprising range of variation in the flowers of this plant, far beyond anything we have ever seen here. Altogether there were eighty-eight pictures of Nelumbium, including leaves, seed-vessels, germinating seeds, roots and rhizomes, besides flowers. I made tracings of some of the most striking of the latter. In size the range was from that of a Niphetos rose to one almost equal to the flower of Victoria regia, the largest measuring eleven inches in diameter. In form, in the width and number of the petals, and in pose there was considerable variation, while in color the variety was equally striking. My notes of the colors of some are: rose, with crimson tips; yellow and white; pure white; white, golden at the base; white, edged with yellow; white, margins crimson, flecked with maroon; crimson. In 1887 some rhizomes of Nelumbiums from Japan were obtained for Kew, and among them there were deep red and pure white ones. These are in the collection still. The late Sir George Macleay tried several times to introduce these fine Japanese Nelumbiums, but did not get any except the white and rose-red kinds. Probably you would meet with much better success in America. Our difficulty is in establishing the plants the first year and getting growth into them of sufficient strength to carry them through the winter. Nelumbium is not by any means a kindly plant with us.

Japanese Bindweeds.—The picture of the double-flowered Convolvulus recently published in Garden and Forest (vol. v., p. 592), recalled to my mind an interesting communication from an English correspondent in Japan in 1885, accompanied by a collection of seeds of garden varieties of Convolvulus major, among which were supposed to be double-flowered and many colored kinds. He wrote: "Your request for some Convolvulus-seed came very opportunely, as it was at the season when the plants are offered in pots in bloom for sale. I bought fifty to plant, and saved the seeds from them myself. Some have sky-blue, some yellow, flowers, and two of the seeds are from one which had a stem like a Cockscomb, is two feet high, has variegated leaves and flowers growing from the sides of the stem. We have also a double Convolvulus in all colors. I planted some among the single ones, and I have no doubt some of the seeds sent will be from plants impregnated from them. We grew these plants in a sunny greenhouse, but found no double ones among them. There were, however, some pretty colored forms among the single-flowered kinds." A race of C. major with double flowers in various shades would probably be of considerable value in the garden, as the flowers would, no doubt, remain fresh longer than the single forms do. It would be interesting to learn how these double-flowered forms are obtained and perpetuated by the Japanese. [The Morning-glory grown in such large quantities in Japan in pots appears to be Ipomœa triloba, Mig.—Ed.]

Narcissus Broussonetii.—This rare and interesting species is said to be a good plant for cultivation in pots to flower in February. The bulbs should be planted in good soil in pots in October or November, and kept in a slightly heated frame where they will get plenty of light after growth begins. After flowering they should be plunged outside for a time till growth is finished, and then shaken out of the soil and thoroughly dried. The plant is a native of Morocco, where it was found by Broussonet, but was not introduced into cultivation until a few years ago, when it was sent to Kew, where it flowered in a greenhouse in the spring of 1888. It has long narrow leaves and tall scapes, bearing umbels of from four to eight flowers, which are pure white, trumpet-shaped, and an inch across the limb. They are remarkable in having the corona reduced to a mere rim and stamens much more prominent than usual. They are also sweet-scented.

Cynorchis grandiflora.—This Orchid has lately been introduced into England and shown in flower by Messrs. Lewis & Co. at a meeting of the Royal Horticultural Society, when it received a botanical certificate. The genus, which is confined to Madagascar and the adjacent islands and is composed of fourteen species, belongs to the Ophrydeæ and is closely allied to Habenaria. C. grandiflora appears to be the largest-flowered species known. It has a tuberous root-stock, fleshy, green, deciduous leaves nine inches long, one-third of an inch wide, channeled, green above, striped or blotched with purple below; scape, nine inches long, erect, one-flowered. Flower, of three lanceolate sepals, an inch long, white with purple spots; petals reduced to filaments; lip, large, one and a half inches long, one inch wide, three-lobed, spreading, colored pale violet with a white claw; spur, straight, two inches long, slightly swollen in the lower half. C. grandiflora, when wild, frequents wet places and appears to require the same kind of treatment as suits Disa grandiflora, with more warmth. When not in flower the plant might easily be taken for a Disa. It was introduced from Madagascar along with D. incarnata. I am afraid it will not find much favor as a garden Orchid.

London. *W. Watson.*

Cultural Department.

Fatal Club-root of Turnips.

Last autumn some diseased turnips were brought to the station laboratory with the complaint that a large field of them was rotting badly, and that the crop would be a failure. An examination showed that the trouble was caused by the Club-root Fungus (Plasmodiophora Brassicæ, Wor.) This rot of the turnip infests the cabbage also; the Cabbage Club-root has been known since 1780, or more than a hundred years. It has a common name in many languages, and several in the English, "Fingers-and-toes" being one of them. These various names come usually from the prevailing habit of distorting the roots of the Cabbage or Turnip into a knotty mass.

It is difficult to estimate the loss to the cabbage and turnip crops from this enemy. Mr. Eycleshymer, in his recent paper upon the "Club-root in the United States," * states that for Russia the loss for 1876 was $225,000. It must be much more in this country. Much of the damage is done to seedlings, which it attacks in the seed-bed, sometimes ruining every plant; the sickly plant is unable to form any healthy roots, and therefore quickly succumbs. The fungus works below ground, and is therefore difficult to detect until the plant is beyond recovery. Besides this, it is a fungus that works in the individual cells of the root, and has no filaments that reach from cell to cell, and no spore bodies that form outside of the affected parts. The diseased root upon removal from the soil will be found much knotted, with soft rotting places, which give off a most disagreeable odor. New roots may start out above the diseased portion, which in turn become affected, and the Cabbage or the Turnip falls a victim to the countless germs that have multiplied within its substance.

* *The Journal of Mycology*, vol. vii., No. 2, March 10, 1892.

The accompanying illustration is from a photograph of a turnip, natural size. The lower portion of the original root had rotted off, warts had formed, and new roots were sent out to get nourishment for the starving plant. Precautionary measures are the only effective ones, for when the fungus has got a hold there seems to be no help. The germs, as the tissue of the host decays, are set free in the soil. How long they may survive there without the appropriate feeding plants is not known. It is certain, however, that Cabbage planted to succeed a badly infested crop, is attacked by an increased development of the fungus. Turnips should not be grown after an infested crop, as they will share the same fate. Radishes will also take the club-root under these conditions. It is possible that this fungus lives upon the roots of weeds of the same

Fig. 14.—Club-root Fungus (Plasmodiophora Brassicæ).—See page 78.

family as the three crops named. These include the Shepherd's-purse, all kinds of Mustards, Pepper-grasses and the like.

If the trouble begins in the hot-bed, all club-rooted plants should be discarded at setting-time. New soil should be used for seed-growing the next year. The rubbish left after a crop of cabbage or turnips is harvested should be burned.

Rutgers College. *Byron D. Halsted.*

Water-lilies from Seed.

TO raise flowering plants of any kind from seed requires patience and enthusiasm, but it is always a fascinating and interesting pursuit. Though the general characteristics of plants raised from seed are similar, they vary greatly in vigor, size of leaves and in the color and markings of the leaves and flowers. Raising Water-lilies from seed is quite a new idea with general flower-growers. Those familiar with our native Water-lily know that it is readily propagated by the root, which is perennial; but there are exotic Water-lilies which differ, not only in the color of the flowers, but also in their leaves and roots. Most of these do not have fleshy or rhizomatous roots, like our native Nymphæa odorata, but reproduce themselves by seed. Of course, a Lily from the tropics will not succeed under exactly the same conditions as our northern varieties.

The tropical kinds, with their gorgeous coloring, are now indispensable, and all of these produce a tuberous root and flower from a crown. Some of these tubers are very difficult to winter over. On the other hand, they produce seed very freely and can be treated as annuals, but seedlings must be started early in the season if good flowers are to be had in plenty. It takes from three to four months to raise plants fit to set out at the beginning to the middle of June, but where temperature above seventy degrees cannot be secured a still longer time will be required. Seed may also be sown in fall, and young seedlings successfully carried through the winter season in a lower temperature than that necessary for germinating seed at this season.

Seeds of Water-lilies differ but little from other flower-seeds, and the same method must be observed in having suitable pots or pans for sowing the seed; a four-inch pot will hold a good number of seedlings of any one variety. Finely sifted soil, not too rich or light, should be used, the pots compactly filled to within an inch of the rim and leveled off so as to leave a smooth surface. The seed should be scattered evenly and covered with clean sand. After sowing, stand the pots in a vessel of water at a temperature of seventy degrees. A shallow tub will be found very useful for this purpose. Do not cover the soil in the pot with water for a few hours, as the dry seeds would rise to the surface, and if there is more than one variety would easily get mixed, if not lost. After the pots have thus soaked for about two days they should be covered with water to the depth of an inch. Should they be lower than this from the rim of the tub they may be raised with blocks to the proper height. The tub must be full of water so that any scum can be taken off without disturbing the pots or plants. At first appearance the seedlings look more like blades of grass of a brownish color, but very soon the small green leaves are seen. As soon as the second or third leaf appears the seedlings should be singled out and the strongest pricked into pots. When they attain strength and size they should be potted singly in three-and-a-half-inch pots. When pricking off the seedlings the young plants can more readily be taken hold of under water. As the plants advance in size they will require deeper water. The soil for plants in three-and-a-half-inch pots and larger may be used in a rougher state than for seed-pots. Good maiden loam, with thoroughly rotted manure, or soil that is good for Roses, with an addition of about one-third more manure, will answer for the purpose. Cover the tops of all seed pans and pots of various sizes with clean sand when fresh potted, to keep the surface clean and the soil from rising. When plants in three-and-a-half-inch pots require repotting they may be potted into five or six inch pots or planted three in a tub. But if strong plants are desired they should be set singly in six-inch pots, and after that planted into tubs for summer blooming, using the same kind of soil in a rough state, but thoroughly mixed. If kerosene barrels or other large-sized casks are sawed into tubs for use there should not be more than two or two and a half inches of wood left above the top hoop, or the staves will open and the tubs will not keep full of water; besides, they will be found too heavy to move, if that should be necessary.

Dongan Hills, N. Y. *Wm. Tricker.*

Decorative Species of Asparagus.

UNDER this heading are included some of the most elegant of decorative plants, their slender branches reminding one of Fern-fronds, which they surpass in their longer endurance when cut. For conservatory decoration, and even in the window-garden, some species of Asparagus are excellent; a very high temperature is not necessary, and no special culture is needed to insure a satisfactory growth. Good loam, preferably of a light character, is the best soil for these plants, and proper attention should be paid to the drainage of the pots; for while an ample supply of water is needed at all times for Asparagus, stagnant moisture will soon cause the roots to decay.

Propagation of some of the species can readily be effected by means of cuttings, but with others there is much difficulty in inducing the cuttings to root, and consequently either division of the roots or seeds must be depended on. Among the specially desirable species is A. plumosus and its variety nanus, the type being a stronger grower and more scandent in habit than the variety, growths fifteen to eighteen feet in length not being uncommon on strong, well-established plants. A. plumosus nanus is better suited for pot-culture than the type, its growths being more slender; in habit it is tufted, and the color of the foliage is dark green. The Fern-like branchlets of these plants are almost invaluable for mingling with cut flowers, and may be used repeatedly with fresh flowers, the Asparagus keeping in good condition for two or three weeks in water.

A. tenuissimus is another valuable sort, and also grows to a considerable height when planted out in a greenhouse; the leaves are extremely fine and the branches less regular in appearance than those of the preceding varieties; it is also of a much lighter green. By cutting back from time to time, A. tenuissimus may be grown into a desirable pot-plant, and in this condition makes an admirable addition to a decoration. This species may be multiplied easily by cuttings made from the small side shoots, providing the wood is not too soft, and also that the cuttings are given some bottom-heat, the young plants soon starting into growth from the bottom after they are potted off. These three sorts are the ones chiefly grown by commercial growers at the present time and form an important part of most house-decorations. There is no other foliage so well suited for draping a large mirror or forming a delicate tracery of green on a table.

Asparagus decumbens is of somewhat similar character to A. tenuissimus, but has coarser foliage of a slightly glaucous hue; the branches are of irregular form and the habit of the plant is scandent. This species has not been received with so much favor as some others, but it becomes an attractive plant when well grown. A. virgatus is a later introduction than the sorts already mentioned and seems to have a compact habit and frond-like branches, the growth being quite unlike the other members of this family. The leaves are very fine and are produced in great numbers on the much-divided branches, which are erect.

It may also be noted that the so-called Smilax of the florists, generally known as Myrsiphyllum asparagoides, has now been referred to Asparagus, so that this charming vine can safely be included among the decorative Asparagus; the conditions favorable for the development of Smilax will generally give good results when applied to the other members of the family. Asparagus-seeds should be sown in light soil, and will germinate at irregular intervals, some of the seeds possibly remaining dormant for nearly a year.

Holmesburg, Pa. *W. H. Taplin.*

Winter-flowering Plants.

A LARGE assortment of plants has to be grown to keep the conservatory or greenhouse supplied with flowers during the dull winter months. For this purpose there are some plants which are indispensable, owing to their free-flowering habit and to their simple cultural requirements.

Notwithstanding that Peristrophe speciosa, often seen in gardens under the name of Justicia speciosa, has been in cultivation since 1826, it is still one of the favorite plants for brightening up the conservatory at this season of the year. It is so well known that it requires no description. Although easily grown, it is often seen in bad condition, with long, naked stems. This is due to bad treatment, for the habit of the plant is good, but, like other free-growing plants, it is apt to lose its lower leaves under bad management. To get good results this plant should be propagated every spring. When the old plants are done blooming a few should be saved and cut back so as to get good cuttings from the young growth. The cuttings should be struck in March, and if put in sand with a gentle bottom-heat they will root in a few days. When rooted, they should be potted off singly into small pots and placed near the glass in a warm house. As soon as the roots get hold of the soil the points of the shoots should be stopped so as to induce a bushy habit. They should be planted out in the garden about the end of May and given plenty of space, as they will make large plants by the time they are lifted in the fall. During the summer the young shoots will require to be stopped frequently, and as the plants are free growers they will need an abundance of water. When they are about a foot high they should be staked, as they are very easily broken by wind, and in September potted and put into the greenhouse and kept close for a few days. Although this plant will grow in a cool greenhouse, it can easily be seen by its sickly foliage that it is not happy in such a place. It is a native of India and requires a temperature of fifty to sixty degrees to produce its beautiful carmine-purple flowers.

Another exceedingly floriferous plant in bloom now is Strobilanthes isophyllus. The plants in bloom were raised from cuttings struck last spring, and are about two feet high and one foot across. They are completely covered with their beautiful lavender-colored flowers, which will last five or six weeks if the plants are kept in a warm greenhouse. This plant has a rather erect bushy habit, with dark green lanceolate leaves. Strobilanthes anisophyllus is also in bloom. This species has not such an erect or bushy habit as the first-named. It grows higher and its branches have a beautiful, graceful habit. The flowers are almost the same as those of S. isophyllus, but the leaves are larger and are very unequal. They both require the same treatment. Although the two species are very like one another in their flowers, they are quite distinct otherwise, and they are well worth growing together.

For continuous blooming during the dull winter months Libonia floribunda has few equals. It is a South American plant, and was introduced from Brazil in 1862. It has elliptic, oblong leaves. The tubular flowers are scarlet, with yellow tips, and are produced very abundantly, one or two from each axil of the leaves. Some time after its introduction it was crossed with Sericographis Ghiesbreghtiana. By this crossing Libonia Peurhosiensis was obtained, which is in many ways an improvement on its parent. It is dwarfer and of denser growth. The flowers are more abundant, there being from four to six at the axils of the leaves instead of two, and their color is a bright rich crimson. At this time both these plants are blooming very freely here. When the plants are done blooming they should be cut back and additional heat given to them, and they will soon make a new growth. From the young growth cuttings may be made and inserted in the cutting-bench, where they will root in a few days. When rooted they should be potted; they will require to be occasionally checked, so as to encourage a bushy habit. In June they may be planted out in the garden, where they must be well watered; and as they are liable to be attacked by red spider they must be syringed frequently. In September they ought to be potted and taken back to the greenhouse. When the pots are full of roots the plants are greatly benefited by occasional doses of liquid-manure.

For the last six weeks, Winter-sweet, or Toxicophlæa spectabilis, has been one mass of white flowers. The Jasmine-like flowers are not only beautiful, but are also very fragrant, one plant being sufficient to perfume a whole house. It is a small shrubby plant with lanceolate, leathery leaves, and the flowers are produced in axillary corymbs, making a long dense spray. This plant was introduced from South Africa in 1872, and although it has been in cultivation twenty years, it is seldom seen. The popular belief is that this Toxicophlæa requires a stove-temperature, but this is a mistake; it grows and flowers more freely in an intermediate temperature. The plants in bloom here have been grown in a house where the temperature runs from fifty to fifty-five degrees. In the spring they are potted rather firmly in good rich soil, and in summer placed out-of-doors in a position where they can get plenty of light. After they are taken back to the greenhouse in the autumn they are greatly benefited by a few waterings of weak liquid-manure. During the spring months cuttings are easily struck from the half-ripened wood.

Among New Holland plants the Chorizemas are the showiest at this time. Chorizema ilicifolia, with its deep green Holly-like leaves, is completely covered with orange-yellow flowers, which will last in bloom a long time. The Chorizemas are not so hard to grow as some other hard-wooded plants. When they are done blooming they should be pruned so as to make compact plants. Just as they begin to make new growth the plants ought to be potted in a mixture of fibrous loam, peat and sand. Like most other hard-wooded plants, they need to be potted firmly, and given plenty of drainage, as they require an abundance of water during the growing and flowering season. Abundance of light and air is very essential to their welfare, and in summer they should be placed in the open air, where the new growth will become thoroughly ripened. Before taking them back to the greenhouse the plants should be staked up, and the small shoots left loose, that is, not tied in tightly on trellises, as they are treated sometimes. Chorizemas can be raised from seeds or cuttings. The small side-shoots are not hard to strike, and plants raised in this way flower while small, whereas seedlings are not so free-blooming while they are young.

Cambridge, Mass. *Robert Cameron.*

Manettia bicolor.—Running over a Grevillea is a noteworthy specimen of the Manettia bicolor, which is planted with it in the ground. This seems to be the only satisfactory way of growing this vine, as I find it but seldom blooms with pot-culture. Upon this plant, which is now a little more than a year old and which has been eight months in its present position, I estimated about 800 flowers. This floriferous condition has been maintained ever since the plant became established in the new ground. In the greenhouse it is subject to attacks of the mealy bug, but this insect can be successfully held in check by frequent syringings of Fir-tree oil. Some of the catalogue wood-cuts exaggerate the size of this flower by representing it to be as long as the leaf, and I have even seen it

stated that the flowers are 1½ to 2 inches long. The particular vine I have mentioned is in a very thrifty condition; the flower is tubular with four short lobes scarcely spreading, covered on the outside with a coat of short, bright scarlet hairs, which conceal the yellow tube except at the apex. The flower-buds, many days before opening, show these colors and add greatly to the apparent abundance of flowers. The flowers, after opening, are from ¾ to 1 inch long, and keep fresh upon the vine for ten or fifteen days. The inflorescence is solitary and axillary, but as the flowering branches are very short, as many as six flowers seem to appear at each joint of the vine. Maturing at different periods, fresh flowers and buds are seen for several months upon the whole length of vine. The leaves are opposite, ovate, acuminate, glabrous, shining; margin entire; the length of leaf from one to four inches. The stem is tetragonal, twining, and will grow from ten to twenty feet long. The plant is allied to the Bouvardia and was introduced into England about 1842 from Brazil.

State College, Pa. *George C. Butz.*

Correspondence.

The Treeless Plains.

To the Editor of GARDEN AND FOREST:

Sir,—We are readers of GARDEN AND FOREST and sympathize with the efforts of the paper to instruct the public with regard to the importance of preserving the American forests. We are particularly interested in forestry and should like to see it discussed in detail, particularly with reference to the region west of the one-hundredth meridian and east of the Rocky Mountains, now treeless. This part of the country has not been an unqualified success, although large enough to support a nation. The few attempts at planting trees there have so far been subterfuges used to obtain possession of the public domain, and have only demonstrated the fact that forest-trees cannot be grown there. Will not GARDEN AND FOREST urge the importance of this region on its readers that they may come to think more seriously of its possibilities?

Blue Springs, Mo. *E. J. Walker & Co.*

[Trees, in order to grow, require evenly distributed and abundant rainfall, and the reason that the great elevated plateau east of the Rocky Mountains is destitute of trees is that it does not enjoy a sufficient precipitation of moisture to enable them to live. Rain causes trees to grow, but trees do not produce rain. The Timber-culture Act, which sought to cover these plains with trees, was abortive because, conceived in ignorance of the true conditions of the country, it sought to produce results which were physically impossible. Trees will grow anywhere between the one-hundredth meridian and the Rocky Mountains where sufficient water can be obtained for irrigation; but unless the ground is artificially watered most of this great region must remain treeless, except in the immediate neighborhood of streams.—ED.]

The Sierra Club of California.

To the Editor of GARDEN AND FOREST:

Sir,—The second issue of the *Bulletin of the Sierra Club* has appeared. It contains three articles, any one of which would easily furnish the basis for a sixteen-page magazine article. One is by Mr. Hubert Dyer, a capable young chemist, a graduate of the University of California, and for some time an assistant in the agricultural laboratory there. It is upon the Mount Whitney trail, and is illustrated by a map and by two reproductions of Mr. Dyer's photographs, one of "False Mount Whitney," or "Sheep Mount," or "Mount Corcoran"; the other of the true Whitney, the highest peak in the United States. Mr. Dyer and several friends have wandered for weeks in the fastnesses of the Sierra Nevada, and few young Californians have seen more of the "Whitney Alps," and the vast sea of mountains about the head-waters of Kaweah, Kern, South Fork, Cottonwood and Lone Pine, where hundreds of great peaks rise about the still greater shoulders of Tyndall and Whitney.

Mr. R. M. Price describes in most vivid language a difficult and dangerous descent, in company with Mr. L. de F. Bartlett, of the Grand Cañon of the Tuolumne, one of the most magnificent of the Yosemites of the Sierra, where mighty waterfalls "plunge amain" down granite cliffs.

Mr. W. W. Price gives a more complete description of the Placer County grove of Sequoia gigantea, which he was the first to make known. The first memorandum of this discovery was read before the California Academy of Sciences in August, 1892, and published in *Zoe*, GARDEN AND FOREST and other papers. The new grove is "at an altitude of 5,100 feet, and nearly seventy miles north of the Calaveras Big Trees." It has been known to the mountaineers for many years, but not to the botanist. Mr. Price was led to visit the place because of a report obtained in the region by Miss Irene Hardy, teacher of English literature in the Oakland High School.

The three articles, taken together, so emphasize the present needs of California in respect to forest-reservations, such as outlined by Secretary Noble, that they ought to be in general circulation. It would be a national misfortune if the next Administration should pay any heed to the querulous complaints of a few sheep-men who live by stealing public pasturage, and a few politicians who only see their own petty interests.

The Sierra Club, John Muir, President, contains among its members some of the most thoughtful, well-educated and influential men in California, and its work is certain to be felt in every direction. It opposes, after full and free discussion, the Caminetti bill to curtail the Yosemite National Park. It favors the proposed topographical survey of California by the state and the general Government. It has voted to do all in its power to aid the passage of the Paddock Forestry bill. In every move it has made the Sierra Club has been well and wisely directed, and it does not lack the necessary funds, and, still more, essential fighting quality. At the present rate of growth it will have a thousand members in a few years—merchants, professional men, horticulturists and men of affairs in every department of human activity.

Berkeley, Cal. *Charles Howard Shinn.*

Valves in Heating Apparatus.

To the Editor of GARDEN AND FOREST:

Sir,—Are valves necessary on hot-water pipes to properly regulate the temperature of plant-houses or any horticultural buildings in which heat must be provided by such heating apparatus? Is there any means of controlling the temperature of hot-houses under all conditions of sunshine and cloud and sudden changes of temperature in the open air without the use of valves? Would you advise the building of a hot-water heater for horticultural purposes without valves? Is there any danger of steam being generated in an apparatus furnished with valves, provided an open vent or valve is fixed on the highest point of the boiler and on the highest point of the flow-pipe?

Eddy, New Mexico. *W. S.*

[If a number of greenhouses require different temperatures, and are heated from one set of boilers, stop-valves should be used on each flow-pipe in each house in order to regulate the temperature in the different houses. If, however, only one house is being heated, flow-pipes would be convenient and advisable, but not necessary to control the temperature, as it could be controlled by regulating the fire. The only means of regulating the temperature in a greenhouse without valves is by sash-ventilating and by watching the fires. The omission of valves in the hot-water heating system is not advisable, except in the case of small conservatories. If all the flow and return pipes at or near the boiler should be valved and the valves shut off, steam would be generated in the boiler, and it would burst. Valves should not be placed on either flow or return pipes except in the grapery or in houses that require freezing, in which case the valves are shut off and the water drawn from the pipes. If valves are used on the flow and return pipe at the boiler they should be chained and locked, so they cannot be closed except by the person in charge of the key.—ED.]

Flowers in Winter.

To the Editor of GARDEN AND FOREST:

Sir,—The ease with which some of our common plants can be forced into bloom in ordinary living-rooms during winter should lead to their more frequent use in this way. At this time of the year a few standard but relatively expensive things, like Hyacinths, are favorite window decorations, but sprigs of our common shrubs, our native bulbs and perennial plants are seldom seen flowering indoors, although their treatment for this purpose is of the simplest character, and presents no

difficulty which a novice or a child may not readily overcome. Anything which prepares its flower-buds the year before, and is then ready for early-spring blooming, is fitted for this simple kind of forcing.

To show how easy and effective the process is, the following example is given. On January 3d, a few branches of Forsythia suspensa were cut from an outdoor bush, put in a vase containing water, and left on a table in my room. Water was supplied as fast as it evaporated, but no other care was given. In about a week the buds had begun to push, and their scales were distinctly separated. From this time the growth was rapid. On the 11th inst. the yellow petals showed plainly; on the 17th a few flowers were wide open, and on the 22d there was a mass of yellow bloom almost as abundant and with flowers as large and perfect as we see out-of-doors in April or May. They will remain in good condition for ten days or more if the air of the room does not get too hot and dry. Later in the season the time required for forcing is somewhat less, and in March, only a little before the time for natural flowering, eight or nine days is sufficient. The Forsythia is specially well adapted for this purpose, since it is a profuse bloomer, perfectly hardy, and, although not a native shrub, is one which is deservedly becoming very common and seems already as thoroughly at home here as in its native China. I seldom let a winter pass without having at least one such bouquet, and some years have repeated the process at short intervals, since material is so abundant and so little trouble is required. Other shrubs could be used in the same way.

Of slightly different character only is the forcing of such native plants as the Bloodroot. Where they are abundant it is generally not difficult to dig out a few of the large root-stocks with the buds uninjured, and treat them the same as Hyacinths or put at once into earth in flower-pots. They will flower in a few weeks, and, although short-lived, the purity of their blossoms and the curiously shaped leaves which quickly follow fully repay the trouble.

Such simple practices have an added value in any household where there are persons—young or old—who have an interest in the life of plants as well as in the beauty of their flowers. They suggest and provoke inquiry as to how plants live and have their being; and this flowering, which appears at first to be entirely out of the course of nature, is only what we should expect under the circumstances. The late winter, moreover, is apt to be a trying time for all who are condemned to an indoor life. Although the backbone of winter may be broken, and, by the almanac, spring near at hand, yet we long for a touch or a hint. We would have a sign. The dormant life in many of our native plants can be quickened and forced in our ordinary living-rooms, and thus make more real to us the promise of the coming days.

State College, Pa. *W. A. Buckhout.*

Salix balsamifera.

To the Editor of Garden and Forest:

Sir,—In your account of Salix balsamifera, published January 18th, you overlook the fact that this plant has been detected at Mount Mansfield, Vermont. Soon after finding it in the White Mountains, Mr. Pringle discovered one bush on a shelf of the cliff on the north peak of Mount Mansfield, south of the hotel, but in sight of it. It occurs also in several places along the carriage-road, about a mile and a half from the hotel. Last spring I transplanted several specimens into the arboretum of the St. Louis Botanic Garden, and when I left there, at the beginning of last spring, they appeared to be doing well.

Charlotte, Vt. *F. H. Horsford.*

Second Crop of Potatoes.

To the Editor of Garden and Forest:

Sir,—I observe in the report of the Kansas Horticultural Society that there was some surprise at the possibility of growing two crops of potatoes in the same season. This practice of raising a second crop has long been common in the south. The superiority of these late-grown potatoes for spring planting over potatoes brought from the north is now so well known to planters that this year's supply will probably reach fancy prices by planting-time, since the crop was short owing to drought. Had the season been favorable the fall potato crop would have been a large one, for the reason that the breakdown in the price of the early crop left a great many of them in the growers' hands, and, as a consequence, there was a much larger acreage planted than usual. Last spring there was quite a demand northward for these potatoes for planting, a demand that is likely to grow larger. Interest in this second crop, therefore, as a profitable one for the south, will doubtless increase, since all who planted them northward, so far as I know, have been pleased with the results.

Raleigh, N. C. *W. F. Massey.*

How to Get a Blue Glass Sod.

To the Editor of Garden and Forest:

Sir,—In an address before the New Jersey Horticultural Society, on the "Formation of Lawns," which was published in vol. v., page 618, Mr. George C. Woolson advocates the plan of getting a perfectly pure sod of a fine variety of Rhode Island Bent Grass, and then, breaking this up into separate plants, he sets them out a few inches apart. His experiments have convinced him that this is a better way of getting a good lawn than the ordinary way of sowing seed. In the course of his paper he adds, "I believe that farmers might adopt this method of putting down their fields to grass where labor is not too high." This is a plan which I have recommended and tested. Fifteen years ago I was seeding a twenty-five acre pasture-lot, and as an experiment I grafted, as I called it, half an acre in the following way, with Blue Grass sod: I broke the sod up into pieces about two inches square and dropped them a yard apart each way on the plowed surface and then pressed them in by stepping on them. The first year these pieces spread to the size of a dinner-plate and in a few years I had a complete sod. I believe this would work well on a lawn; only the pieces might be dropped a foot apart. I would sow the ground with pure Timothy-seed at the same time I planted the bits of sod, for this would give a fairly good stretch of green at once, while the Blue Grass would crowd it out entirely in two years.

Oxford, O. *Waldo F. Brown.*

Recent Publications.

In Lynn Woods, with Pen and Camera. By Nathan Mortimer Hawkes. Lynn, Mass: Thomas P. Nichols.

This little book, with its charming illustrations of the noble woods of Lynn, is full of interest to the lover of old New England towns, with their early customs and socialistic experiments, and is attractive to the lover of the woods from its pleasing descriptions of the forest, its glens and slopes, its rocks and brooks, and the overshadowing trees in interesting variety. Its writer is learned in the legends of the region, and has many a tale to tell which imagination might expand into romance. The attraction of these woods and hills, which were in the earliest days of the settlement the commons of Lynn, is inexhaustible.

The story, too, of how the woods were re-acquired for the people is well worth telling, and the energy and enthusiasm shown by Mr. Tracy and Mr. Chase, in impressing upon the town the value of its antique possession, are an example to all who take an interest in the preservation of forests. The Massachusetts people take a just pride in the Puritan settlements, which still preserve in the commonwealth the importance of precedent. The great names associated with them are reverently spoken, and if some are of but local fame they are still hallowed in the memory of the towns which owed to them their foundation and prosperity. These local names are preserved in the Lynn woods, attached to hills and sections of the park, so that they shall be held in eternal remembrance by the community; and it is pleasant to think that in that stirring manufacturing town, given over to shoemaking and other prosaic industries, originated the first systematic movement in the state toward preserving the forests as a treasurer of the water-supply, and as the guardian of their purity and wholesomeness.

Curiously enough, the deserted commons were less known to the present generation than to the early settlers of Lynn, until, in 1870, the city purchased Breed's pond as a water-supply. From that time onward a series of intelligent men, like Mr. Edwin Walden, Mr. Cyrus M. Tracy and Mr. Philip A. Chase, have labored to add more and more to the city's tract of woodland, until at this time there are 1,600 acres of undisturbed forest, contiguous, not only to the city which owns them, but to many neighboring towns, of inestimable service to the rapidly growing population as a place of healthful resort. Sixty-seven acres have been acquired by gift, but the rest has become public property by purchase or by the right of eminent domain. Lynn thus holds, not merely a newly planted pleasure-ground, but a properly guarded woodland of real antiquity.

The Lynn woods have acquired, not only a local, but a national fame, as a successful municipal experiment in practical forestry, proving satisfactorily that by keeping the hill-sides clothed with the living drapery of trees, the soil will not shrivel, nor the springs go dry. Moreover, it takes careful charge of this public domain, to the end that it may not be wasted by fire, nor by depredations or defilements of any kind that may interfere with the healthfulness of the waters. The study of forestry is in its infancy in this country, and it is a great thing to have at hand such an experiment as this, to be studied on a large scale and quoted as an example of wise and judicious practice of that valuable art. The author speaks with enthusiasm of his subject, dwelling affectionately on the ancient customs and the strange adventures of the singular people who have been associated with these woods. He describes, with vigor and grace, the rocky summits and the comprehensive views that are characteristic of this region; he interspersses his narrative with quaint bits of verse and prefaces his chapters with apt quotations, while the photographic reproductions bring vividly before us the winding woodways, the broad extent of lake after lake, the wild brooks that tumble under the Hemlocks; the strange rock formations, known as the Dungeon and Sugar-Loaf; with glimpses of the heart of the woods shimmering with the foliage of Birches, or dark with Oak shadows and massive trunks. We see the old pastures, with their dividing walls of immense extent, built by the early settlers, working together for the common good; the camp, and the rustic tables and benches where the picnickers take their luncheon; with bird's-eye views from the high summits of Mount Gilead and of Burrill Hill, "the granite backbone of the woods, upon whose naked surface titanic agencies in prehistoric ages hurled mighty boulders from far-off regions." To one familiar with the woods these pictures are full of suggestion, and to those who know them not they are still beautiful and interesting.

The book shows how much is due to individual effort, and how great a service the preservers of the woods have rendered to their fellow-citizens in its protection, and makes us thankful that in the heart of man lingers so fond a love of Nature, and so active a desire to communicate it to others. The appropriate motto from Emerson, which opens the book, seems to strike its keynote: "The tempered light of the woods is like a perpetual morning, and is stimulating and heroic. The anciently reported spells of these places creep on us. The stems of Pines, Hemlocks and Oaks almost gleam like iron on the excited eye. The incommunicable trees begin to persuade us to live with them and quit our life of solemn trifles."

Exhibitions.

Flower Pictures at the Academy of Design.

A GOOD many paintings of flowers and fruits may be found at the water-color exhibition now open in the Academy of Design; but the average excellence in this branch of water-color painting seems lower than it has been during the past few years. Roses, as usual, are attempted more often than any other flower; but the fact that they are the most difficult of all flowers to paint speaks clearly from every wall. It seems almost impossible to render in paint all the characteristics which make up the beauty of our florists' Roses—their bearing, which is always graceful yet sometimes very sturdy too; the peculiar quality of their color, which results from the delicate yet firm substance of their petals; and the solidity which the close association of many of their petals suggests. We often see painted Roses which are not quite exact even in color, because they are not both solid and delicate—because they do not suggest at once firmness of build and fragility of texture. Sometimes our painted Roses look like tin, and sometimes like cotton, and sometimes like the wraiths of flowers, retaining color but devoid of all bulk and weight. There are examples of all these kinds in this exhibition, with a few in which true excellence has been more nearly achieved. Mrs. Scott's white Roses are better than the pink ones which hang near them, for they have some substance although not quite enough. Miss Wilcox has done fairly well with her Mermets, and I daresay that Miss Finney's red Roses would be satisfactory if they had not been hung almost out of sight, over a doorway. But I do not think that there is one Rose-picture in the whole collection which is all that a Rose-picture should be.

Perhaps the best painting of flowers of any kind is Miss Maud Stumm's "Violets," where we see three large bunches, such as our florists tie, two lying on the table and the other resting in a greenish glass bowl. The general color-scheme in this picture is charming, the handling is vigorous, and the true color and quality of the solid clusters of flowers are delightfully rendered. Next to this should be named, perhaps, Miss Field's crimson "Gilliflowers," in a tall green glass, a drawing which, naturally, is not very graceful in line since it truthfully portrays stiff spikes of flowers, but has much linear dignity, is nice in color, and true to the subject. Miss Abbatt has put three garden subjects, very minutely painted, into a single frame, rather to the injury of their effect. The best of them shows a tall cluster of Foxgloves. Miss Redmond sends a faithful if not very attractive picture of Hydrangea paniculata; Miss Williams a "Garden Corner," where a big group of red Poppies is prettily displayed; and Miss E. P. Williams a good little study of Pansies. Miss Stumm has been almost as cleverly faithful to her little sprays of May-flower as to her big bunches of Violets, and the best of the Water-lilies have been done by Miss Conant. Miss Goodyear's pink and white Chrysanthemums are good, but not especially so, while her pink and white Azaleas, growing in pots, although they make a picture which is delightful in color, lack the transparent crispness proper to the petals of these flowers. Their petals, as Miss Goodyear paints them, look thick and a little woolly; and, again, her big drawing of yellow Chrysanthemums is much better as regards the color than as regards the substance and texture of the blossoms. In a small drawing of Tulips, on the other hand, where only two yellow blossoms are shown, Miss Wilcox succeeds both with color and with texture. Mr. Steele Kellogg's Primroses, in pots and baskets, would be very good if the handling had been a trifle less watery. Miss Arens has painted some dark red Zinnias very well, contrasting their rich tone with the green and tawny colors of a half-glazed pot; and Miss Sylvester's Lilacs are well drawn and good in color, although, once more, lacking in transparency of petal. The best Pæonies—pink and white ones in a glass bowl—have been done by Miss Mary Van der Veer; there are two other pictures of the same flowers in the same room which show that it is easy, on the one hand, to make them look metallic, and, on the other, to give them a cottony aspect. The best bit of fruit-painting is Mr. Beacham's "California Grapes"; and, again, if any one thinks that it is easy to paint as well as this, he will find other paintings of grapes in the exhibition to undeceive him.

One cannot help wishing that a cleverer painter than Mr. Symington had happened to go in his stead to Trinidad. His garden scene, called "January in Trinidad," shows elements which some one with a more facile and spirited brush, and a more poetic sense of color, might have made brilliantly beautiful. But here the vine, which arches over the gate-way, with its burden of purple flowers, and the yellow-blossoming and scarlet-blossoming shrubs which stand near by, do not have their individual charms well brought out, and are not combined into a whole as attractive as Nature must have shown. And much the same may be said of another picture from the same hand, called "A Flowery Road, Trinidad," where we see again great masses of the purple-flowering vine, presumably a Bougainvillea.

One misses from this exhibition several names which in former years have been signed to flower-paintings better than any that the walls now bear. Among these, for instance, is Mr. Hassam, who, if he never professes to paint flowers for their own sakes, has sometimes painted street-venders and their piled-up wares in very delightful fashion; he contributes to the exhibition this year, but no pictures in which flowers play a part. Miss Greatorex is still more sadly missed, for her big decorative arrangements of showy blossoms, often encircled with the white papers beloved of Parisian market-women, are always a centre of attraction wherever one may come upon them. I wish also that Miss Grace Pomeroy had added to her single contribution, a little still-life study, some of the Roses which in former years she has done in an eminently satisfactory way. Nor has Mr. Alden Weir given us this year any of the pictures in which Roses are conspicuously poetized, yet more truthfully portrayed than by most "realists"; nor Mr. La Farge any of the Water-lilies or other flowers which he paints in a different way from any one else—poetizing them, not by enwrapping them in mist like Mr. Weir, but by carefully defining their forms with a hand so delicate and with color so lovely that, while faithfully following Nature, he seems almost to have improved upon her.

New York, N. Y. *M. G. Van Rensselaer.*

Notes.

Mr. T. T. Lyon, of the South Haven Sub-station of the Michigan Agricultural College, finds that the variety of Asparagus known as the Palmetto steadily maintains its superior size and

productiveness. It seems to have acquired a fixity of character through a process of selection.

Mr. John Thorpe, Chief of the Floricultural Department at the World's Fair, is making extensive preparations for a show of Pansies next spring. The seed has come up remarkably well, and it is said that something like a million plants will be exhibited in May. In comprehensiveness and variety the exhibition will probably excel anything that has ever before been attempted.

In the last bulletin from the Iowa Experiment Station it is stated that several dwarf varieties of the June-berry have been tried there during the past ten years, and three or four of them, which have been deemed worthy of a name on account of bearing the largest and best fruits, are being sent out on trial. In size and quality the berries are said to compare favorably with the Large-bush Huckleberry.

We have frequently spoken of the value of Imantophyllum miniatum as a window-plant. It will endure more neglect than almost any other plant, and its umbels of large showy flowers of a bright orange-tinted vermilion will be freely produced all winter long. The plants increase in size from year to year, and there are few others which can be depended on to give as much pleasure for the same outlay of time and trouble.

An article on the Malay Peninsula, published in the January number of *The Century Magazine*, gives a picture of the Durian-fruit, which is famous for its disgusting odor to all foreigners when they first make its acquaintance, and for the unique and delicious flavor to the same persons after they have learned to appreciate it. In the illustration only the lower part of the tree is seen, and the large, oval and pear-shaped fruits hang from stems which come directly out of the trunk and larger limbs. The tree itself attains a height of sixty or eighty feet, with a spreading top, which gives it the general appearance of an Elm.

Many causes combine to operate unfavorably on the growth of trees and shrubs in Holland. The numerous heavy winds in the neighborhood of the sea, and more particularly the north-west winds, destroy the tops of the high-growing trees, break their branches, and by shaking their trunks loosen the roots in the soil and blow the trees down. This is chiefly occasioned by the little depth to which the roots can penetrate into the ground, for as soon as they reach the water they are compelled to take a lateral direction, in consequence of which the trees soon become sickly, or are suddenly loosened from the soft humid soil by the wind.

A novel idea for a park was that of King James V. of Scotland, who founded the palace of Holyrood about 1528, by building a house to reside in, with a circular turret at each angle. To accommodate himself with a park, King James enclosed a large tract of ground in the neighborhood of this place with a stone-wall about three miles in circumference, which, as Maitland says, in his *History of Edinburgh*, "is nowhere to be paralleled; for, instead of trees and thickets for cover, which other parks abound with, I could not, after the strictest search, discover one tree therein: in lieu whereof, it is supplied with huge rocks and vast declivities, which furnish the Edinburghers with the best of stones to pave their streets withal; as do the other parts of the said park yield good pasturage and meadow-grounds, with considerable spots of arable land." Two hundred years after, however, the level portion was covered with magnificent Oaks.

We are occasionally asked whether Orchids can be used as house-plants, and our reply is that we have never seen them used in that way to any great extent, although there is no reason why certain varieties cannot be grown in the windows of ordinary living-rooms. Mr. W. A. Manda says that there are half a dozen Cypripediums which can be grown by any one who knows how to grow a Geranium or a Palm, and among those whose cultural requirements are the least exacting he names Cypripedium insigne, C. Boxallii, C. villosum, C. barbatum, C. Harrisianum and C. Sedeni. Of other Orchids which can be trusted to similar conditions he names Cœlogyne cristata, Odontoglossum Rossi, Phajus grandifolius, Dendrobium nobile, Lælia anceps and Lycaste Skinneri. There are white forms of some of these last which are very beautiful, but they would probably be too delicate for the window-garden. As a general rule, the white varieties of these plants are rather more tender than the types.

From the premium list for 1893 of the Horticultural Society of Wayne, Delaware County, Pennsylvania, it appears that the society was organized in July of last year and met with such popular favor that in two months' time it had two hundred members. At the autumn exhibition last year there were so many visitors that a small admission fee paid all the expenses incidental to the organization and left a small balance in the treasury. The annual dues are only fifty cents, and competition is open to members only. At the spring exhibition prizes are offered for Roses, Geraniums, Heliotropes, Freesias and other plants grown in pots and to be competed for by children. Among the requirements of this class are that the plants must have been grown by the exhibitor personally and that they must come in clean pots. Children's prizes are also offered at the autumn exhibition, and special prizes are offered for the best-kept school-house grounds within five miles of the Wayne post-office, and for the best-kept grounds, irrespective of the size of the lots. There is also to be a competition for collections of wild flowers under admirable rules which regulate the mounting of the specimens, while careful and ample instructions for collecting and preparing these are added. Dr. W. P. Wilson and Dr. J. C. Macfarlane, of the University of Pennsylvania, have each consented to arrange a field-excursion with those who intend to compete for these collections of mounted specimens, when a practical demonstration will be given of the best way of gathering plants and of making observations upon them. On a day set, also, the collectors are invited to visit the herbarium of the university and receive instruction to enable them intelligently to begin the examination of the local flora about their homes. It would be well for the interests of horticulture if a thousand societies, managed with the same intelligence and vigor, should be established this year in as many towns throughout the country.

Bulletin No. 90 of the New Jersey Agricultural Experiment Station is on the subject of grasshoppers, locusts and crickets, and in it Professor J. B. Smith, the entomologist of the station, shows with great clearness that the serious injuries to cranberries, and which have been charged upon grasshoppers, are really occasioned by katydids. This injury is always of the same character. The berry is eaten into from one side, the pulp is rejected and the seeds only are taken. The berry soon dries and shrivels up. Professor Smith, in an instructive way and with abundant illustration, shows how much better equipped for eating into fruits the katydid is than the grasshopper. The head of the katydid enables it to dig into the fruit with a much less expenditure of time and energy than is possible for a grasshopper, while the mandibles of the former enable it to do clean-cut work quite beyond the power of the grasshopper. The digestive system of the katydid also is much better adapted to reduce hard food like seeds than is that of the grasshopper, which has a less powerful grinding apparatus. Still further, by direct experiment with living insects, the truth of this theory was corroborated. The habit of eating seeds only gives the katydid a power to cause much more injury than if the entire fruit was eaten, since the seeds of three or four berries at a meal is easily within the capacity of a single specimen, so that at one meal a day for three weeks a single insect would destroy eighty berries, and no doubt their powers are much greater than this. There is no need here to give the details of the measures which are advised to be taken against this insect, although, in a brief way, what is needed is: (1) A clean bog, that is, a bog free from grasses, rushes, and shrubs. (2) The use of as much water as is consistent with good culture, keeping the soil quite wet in spring until it is thoroughly warm through. (3) A marginal ditch, at least six feet wide. (4) The clearing of all vegetation from the dams, particularly shrubbery, and, where it is possible, the burning over of a fairly wide margin about the bogs after the brush has been destroyed. Every owner of a Cranberry-bog should at once procure this little treatise and study it thoroughly.

Catalogues Received.

J. Bolgiano & Son, 28 Calvert Street, Baltimore, Md.; Vegetable, Grass and Flower Seeds.—Joseph Breck & Sons, Boston, Mass.; Vegetable, Grass and Flower Seeds, Small Fruits, Vines, Shrubs, Shade, Ornamental and Fruit Trees.—Currie Bros., Milwaukee, Wis.; Vegetable and Flower Seeds, Plants and Bulbs.—A. B. Jones, Hartford, So. Dak.; Success Barley.—J. T. Lovett Co., Little Silver, N. J.; Small Fruit Plants, Fruit and Nut Trees, Garden Roots, Ornamental Shrubs and Trees.—Marvin & Brooke, Ithaca, Mich.; Price List of Strawberry Plants.—L. L. Olds, Clinton, Wis.; Seed Potatoes.—Oliver A. Smith, Clarkson, Mich.; Iron Land Roller, Spraying Pump.—J. C. Vaughan & Co., Chicago, Ill., Vegetable and Flower Seeds.